MAINTENANCE BULLETIN

NO. 161
MARCH 1999

4111 San Pedro St., Bldg. 1443
Port Hueneme, California 93043-4410

ALFA COMPANY

CONTENTS

You are invited to send your ideas for improving maintenance procedures, suggestions for articles, or comments on material published in the Maintenance Bulletin. Just write to:

Commanding Officer
Naval Construction Battalion Center
Seabee Logistic Center
Logistic Directorate (Code 15L)
4111 San Pedro St., Bldg. 1443
Port Hueneme, Ca 93043-4410

Cosal Changes

APL	APL,CAGE, P/N	NSN NOMENCLATURE	NEW QTY	UOI	MAIN. LEVEL	PRICE	1	2	3	4	5-8	9-20
0001	955010002	2540-01-217-9503										
ADD	CAGE 60703	REFILL BLADE WIPER										
	P/N 41-160		10	EA	H	4.67	10	20	30	40	60	150
0001	95500001	5940-00-140-9596										
ADD	CAGE 75037	SPLICE										
	P/N C-42-701	CONDUCTOR	1	HD	O	16.06	1	2	3	4	6	15
0001	955250001	5940-01-127-4210										
ADD	CAGE 18399	TERMINAL LUG										
	P/N 38783		1	HD	O	49.92	1	2	3	4	6	15
0001	955070001	2640-01-098-2029										
ADD	CAGE 17875	CAP PNEUMATIC VALVE										
	P/N 627		1	BX	H	1.50	1	2	3	4	6	15
0001	955250001	5945-01-102-6488 RELAY										
ADD	CAGE 76761	ELECTROMAGNETIC										
	P/N FF143A		2	EA	O	4.24	1	2	3	4	6	15
0002	955010002	2540-01-217-9503										
ADD	CAGE 60703	REFILL BLADE										
	P/N 41-160	WIPER	2	EA	H	4.67	2	4	6	8	12	30
0002	95500001	5940-00-140-9596										
ADD	CAGE 75037	SPLICE										
	P/N C-42-701	CONDUCTOR	1	HD	O	16.06	1	2	3	4	6	15
0002	955250002	5940-01-127-4210										
ADD	CAGE 18399	TERMINAL LUG										
	P/N 38783		1	HD	O	49.92	1	2	3	4	6	15
0002	955070002	2640-01-098-2029										
ADD	CAGE 17875	CAP PNEUMATIC VALVE										
	P/N 627		1	BX	H	1.50	1	2	3	4	6	15
0002	955250002	5945-01-102-6488 RELAY										
ADD	CAGE 76761	ELECTROMAGNETIC										
	P/N FF143A		2	EA	O	4.24	1	2	3	4	6	15
3603	950093603	2920-00-033-2587										
ADD	CAGE 79575	MAGNETO										
	P/N XH1343	IGNITION	1	EA	H	53.00	0	0	0	1	1	1
3826	950163826	2530-00-741-1070										
ADD	CAGE 63477	CYLINDER ASSY										
	P/N FF14130E0	HYDR	1	EA	G	59.39	1	1	1	1	2	3
3826	950163826	2530-00-920-7568										
ADD	CAGE 63477	CYLINDER ASSY										
	P/N FD-56113	HYDR	4	EA	G	20.11	1	2	3	3	4	10
5417	950065417	2910-00-371-2846										
ADD	CAGE 72582	FILTER ELEM FLUID										
	P/N 5192854	PRI	1	EA	O	4.66	2	4	6	8	12	30
5417	950065417	2910-00-377-5548										
ADD	CAGE 72582	FILTER ELEM FLUID										
	P/N 5178982	SEC	1	EA	O	2.03	2	4	6	8	12	30
5491	950065491	4730-01-149-5082										
ADD	CAGE 11083	FILTER ELEMENT										
	P/N 8N9803	FLUID	1	EA	O	6.23	2	4	6	8	12	30
5755	950165755	2530-01-105-5742										
ADD	CAGE 62707	CHAMBER										
	P/N M16WR102	AIR BRAKE	6	EA	G	96.64	3	6	9	9	15	21
5818	950165818	2530-00-783-8598										
ADD	CAGE 15564	DIAPHRAGM										
	P/N 8017009	CHAMBER	2	EA	G	5.23	1	2	3	3	5	7
5888	950165888	2940-01-014-2547										
ADD	CAGE 31007	FILTER ELEMENT										
	P/N 290309C91		1	EA	O	5.70	1	2	3	4	6	15

Cosal Changes

APL	APL,CAGE, P/N	NSN NOMENCLATURE	NEW QTY	UOI	MAIN. LEVEL	PRICE	1	2	3	4	5-8	9-20
5888	950165888	3030-00-606-2293										
ADD	CAGE 31007	BELT-V										
	P/N 673950C1		1	EA	O	9.98	1	2	3	3	4	6
5888	950085888	4330-00-274-4712										
ADD	CAGE 33457	FILTER ELEMENT										
	P/N WF2010		1	EA	O	8.37	1	1	1	1	2	3
5889	950095889	2920-01-348-1526										
ADD	CAGE 76761	REGULATOR										
	P/N N3106	ENGINE	1	EA	G	300.98	1	1	2	2	3	4
5962	950015962	2940-01-154-5127										
ADD	CAGE 70040	OIL FILTER										
	P/N PF53		1	EA	O	2.22	2	4	6	8	12	30
6217	950316217	2940-01-280-8420										
ADD	CAGE 18265	FILTER ELEMENT										
	P/N P16-5659	FLUID	1	EA	O	60.06	2	4	6	8	12	30
6336	950016336	5330-01-378-8572										
ADD	CAGE 11862	RETAINER										
	P/N 23502587	OIL SEAL	1	EA	O	4.60	1	1	1	2	2	4
6353	950066353	2910-01-294-4910										
ADD	CAGE 23040	FILTER ELEMENT										
	P/N	FLUID										
	E7HZ9365A		2	EA	O	8.41	4	8	12	16	24	60
6411	950316111	2940-01-280-8420										
ADD	CAGE 18265	FILTER ELEMENT										
	P/N P16-5659	FLUID	1	EA	O	60.06	2	4	6	8	12	30
6411	950316411	2940-01-280-8420										
ADD	CAGE 18265	FILTER ELEMENT										
	P/N P16-5659	FLUID	1	EA	O	60.06	2	4	6	8	12	30
6435	950016435	2940-01-194-9730										
ADD	CAGE 70040	FILTER ELEMENT										
	P/N PF-52	FLUID	1	EA	O	3.11	2	4	6	8	12	30
6474	950066474	2910-01-417-2208										
ADD	CAGE 30554	SWITCH										
	P/N 88-21121-3	LIQUID LEVEL	1	EA	G	153.70	1	1	1	1	2	3
6477	950066477	2940-01-376-7666										
ADD	CAGE 76700	FILTER ELEMENT										
	P/N 85285-F	FLUID	1	EA	O	28.58	2	4	6	8	12	30

CESE VIDEOS

ITEM	UNITS	PART NUMBER	TITLE	TIME
1	2 SETS	441X-V12	Troubleshooting with the VAT 40. Consist of 5 video cassettes. (a) 441.01X Introduction & Meter Reading. (b) 441.02X Performing System Tests. (c) 441.03X Testing Battery Performance. (d) 441.04X Trouble Shooting the Starting System. (e) 441.05X Trouble Shooting the Charging system.	16 Minutes 18 Minutes 18 Minutes 19 Minutes 19 Minutes
2	2 SETS	463X-V12	Front Wheel Drive Transaxle Overhaul. Consist of 5 video cassettes. (a) 463.01X Transaxle Removal. (b) 463.02X Disassembly of Transaxle. (c) 463.03X Subassembly of Overhaul. (d) 463.04X Reassembly of Transaxle. (e) 463.05X Transaxle Replacement.	8 Minutes 13 Minutes 12 Minutes 13 Minutes 11 Minutes
3	1	T0215	Heavy Duty Starting & Charging System Diagnostics.	45 Minutes
4		9035VHS	Testing the CS Series of Delcotron Generator Charging System.	
5		9037VHS	Charging & Testing Delco Remy Heavy Duty Freedom Batteries.	
6	2	1989 March	(Chrysler) Electronic Fuel Injection Update Part I	
7		1989 April	(Chrysler) Electronic Fuel Injection Update Part II	
8	2	1989 June	(Chrysler) Understanding Vehicle Wiring Diagrams	
9	1	1988 March	(Chrysler) A-500 Automatic Transmission	
10	1	1201-207	(Ford) Hydraulic Brakes Medium Trucks.	21 Minutes
11	1	1201-505	(Ford) Hydro-Max Power Brakes.	22 Minutes
12	1	0901-053	(Ford) EEC System Operation.	46 Minutes
13	3	0901-054	(Ford) EEC Driveability Diagnostic.	39 Minutes
14	3	2102-002	(Ford) Engine Noise Diagnosis.	34 Minutes
15	1	2202-007	(Ford) Diesel Fuel & Electrical System, Diagnosis and Repair.	27 Minutes
16	1	2702-002	(FORD) Heavy Duty Truck Cooling System.	22 Minutes
17		2801-208	(Ford) Heavy Duty Truck Starting/Charging.	26 Minutes

CESE VIDEOS

ITEM	UNITS	PART NUMBER	TITLE	TIME
18	1	SAFETY	Wheel & Rim Safety "You May Not Get A Second Chance".	
19	1	25STV0100	(Detroit Diesel) Tune-up I-71 Hydraulic Governor.	2 Minutes
20	2	25STV0103	(Detroit Diesel) Tune-up 4-53 Limiting Speed Governor.	15 Minutes
21	1	25STV0106	(Detroit Diesel) Tune-up 6V-53 Limiting Speed Governor.	15 Minutes
22	1	25STV0109	(Detroit Diesel) Tune-Up 8V-71 Variable Speed Governor.	15 Minutes
23	2	25STV0121	(Detroit Diesel) 8.2L Preventive Maintenance	
24	2	25STV0122	(Detroit Diesel) Tune-Up 8.2L Limiting Speeding Governor.	14 Minutes
25	2	25STV0123	ABC's of Diesel Engines.	13 Minutes
26	1	DKVHI74020EN	(John Deere) It Always Happens to the Other Guys.(Safety)	21 Minutes
27	1	DGVHI75117	(John Deere) Closed Center Component Repair Guide (Steering Valves/Brakes.	37 Minutes
28	2	DGVHI76213	(John Deere) Powertrain Preventive Maintenance.	19 Minutes
29		DGVHI77313	(John Deere) Basic Engine Rebuilt.	60 Minutes
30		DKVHI83905EN	(John Deere) Backhoe Loader Operation.	16 Minutes
31	1	DKVHI83906EN	(John Deere) Backhoe Loader Maintenance.	12 Minutes
32		DGVHI88782	(John Deere) 544E/624E/644E Operating & Maintenance Overview	28 Minutes
33	2	DGVHI89788	(John Deere) How to Get More Out of Your Motor Grader.	25 Minutes
34	1	DGVHU72049	(John Deere) Preventive Maintenance Programs: Engines.	60 Minutes
35	4	TCN 87310	(International) DT-466 Diagnostics	
36	4	TCN 87320	(International) 700/900 Maintenance Training,	7 Minutes
37	4	TCH 87330	(International) TRW-Ross Gear Division Troubleshooting & Service for Models HFB & HF Power Steering.	54 Minutes
38	4	TCH 88317	(International) Clutch Failures Analysis for DANA.	15 Minutes

CESE VIDEOS

ITEM	UNITS	PART NUMBER	TITLE	TIME
39	3	BW-1604	(Bendix) Air Brake System - Part I.	20 Minutes
40	3	BW-1605	(Bendix) Air Brake System - Part II.	19 Minutes
41		SEVN 1900	(Caterpillar) Introduction to Pressure Compensated Control Valves Used in LS/PC Hydraulic Systems	
42		SEVN 1338	(Caterpillar) CAT D8N.	20 Minutes
43	2	SEVN 1402	(Caterpillar) Shop Repair Standard Track.	13 Minutes
44	1	SEVN 1837	(Caterpillar) Introduction to Pressure Compensated Control Valves Used in LS/PC Hydraulic Systems	
45	1	SEVN 9137	(Caterpillar) Final Drive Bearing Adjustment Tool Arrangement.	18 Minutes
46	1	SEVN 9081	(Caterpillar) Lifting a Vehicle with Hydraulic Jack Stands.	18 Minutes
47	2	SEVN 9077	(Caterpillar) Reconditioning Hydraulic Cylinder.	58 minutes
48	2	SEVN 9079	(Caterpillar) Track-Type Tractor Removal & Installation of Track.	25 Minutes
49	1	SEVN 1881	(Caterpillar) 627E Wheel Tractor-Scraper Introduction.	13 Minutes
50	1	SEVN 9198	(Caterpillar) D5H Track - Type Tractor & 55 Winch.	14 Minutes
51	1	SEVN 9030	(Caterpillar) Disassembly & Assembly of Spring Loaded Brake Rotochambers.	50 Minutes
52	2	LEVN 9063	(Caterpillar) Valve Grinding.	20 Minutes
53	2	SEVN 1592	(Caterpillar) Testing the Alternator on the Engine	
54	2	SEVN 1591	(Caterpillar) Testing the Starter on the Engine.	14 Minutes
55	2	LEVN 9062	(Caterpillar) Cylinder Head Reconditioning.	53 Minutes
56		SEVN 9167	(Caterpillar) Fuel Nozzle Testing.	19 Minutes
57		LEVN 9029	(Caterpillar) Servicing the Pencil-Type Nozzle.	30 Minutes
58	2	SEVN 9200	(Caterpillar) Cavitation in Oil.	18 Minutes
59	1 SET	GMX-VV11500	(GM) Truck TBI 220 4.3/5.0/537/7.4L. (4 tapes)	148 Minutes
60	1 SET	GMX-VV117170	(GM) Hydraulic THM 700-R4. (2 tapes)	110Minutes
61		BW-1606	(Bendix) 121 Air Brake Troubleshooting	
62	3	BW-1559	(Bendix) Fundamentals of Air Brake System	

CESE VIDEOS

ITEM	UNITS	PART NUMBER	TITLE	TIME
63	1	SEVN 9071	(Caterpilar) Rebuild Oil Type-Steering Clutches.	19 Minutes
64	1	121 SYSTEM	(Fluid Power) Truck Pneumatics & Air Brake System Part I.	26 Minutes
65	2	PART 1	(Fluid Power) Introduction to Hydraulics Part I	23 Minutes
66	2	PART II	(Fluid Power) Introduction to Hydraulics Part II.	21 Minutes
67	2	PART II	(Fluid Power) Troubleshooting Hydraulic System Prt I.	24 Minutes
68	2	PART II	(Fluid Power) Troubleshooting Hydraulic System Prt II.	26 Minutes
69	1	MODEL 3000D	Water Purification System Operating DEMONSTRATION (APL 6120)	17 Minutes
70	2	1989 JANUARY	(Chrysler) Brake System Update	
71	1		(Accuride) Servicing Single and Multi-Piece Wheels.	18 Minutes
72	1		(Accuride) Servicing and Maintaining Disc Wheels	21 Minutes
73	1		(Accuride) Servicing and Maintaining Demountable Rims	22 Minutes
74	1		(Gunite) Automatic Slack Adjusters	
75	1	572-7056	(Stemco) Wheel Seal Presentation.	14 Minutes
76	1	572-7018	(Stemco) Hub-Seal Installation.	14 Minutes
77	1 SET		(Budd) Wheel Consists of 2 Tapes:	
77A			Introduction Uni-Mount 10.	11 Minutes
77B			Servicing Uni-Mount 10 Wheel	11 Minutes
78			(Talus Resorces) Consists of 2 Tapes:	
78A			Loader-Backhoe (Operator Safety)	20 Minutes
78B			Loader- Backhoe (Worker-Safety)	20 Minutes
79	1		(Talus Resorces) Loader Maintenance	18 Minutes
80	2	EVT-1	(EATON CORP) Drive Axle Failure Analysis	30 Minutes
81	2	EVT-3	(EATON CORP) Drive Axle Maintenance and Overhaul	38 Minutes
82	1	EVT-6	(EATON CORP) 2-Speed Axle Operation and use	18 Minutes
83	2	EVT-7	(EATON CORP) Brake Maintenance and Overhaul.	22 Minutes

CESE VIDEOS

ITEM	UNITS	PART NUMBER	TITLE	TIME
84	2	EVT-8	(EATON CORP) Steer Axle Maintenance and Overhaul.	26 Minutes
86	2	284	(EATON CORP) Parts Inspection -The Key to Failure Analysis.	25 Minutes
87	2	285A	(EATON CORP) Understanding Spur Gear Life.	15 Minutes
88	2	286A	(EATON CORP) Yoke and Seal Maintenance	10 Minutes
89	2	287	(EATON CORP) Clark Transmissions Failure Analysis.	10 Minutes
90	2	288	(EATON CORP) Clark Transmissions Inspestion and Assembly Procedures.	10 Minutes
91	4	T0316	(TMC) Brake Adjustment.	20 Minutes
92	2	VO-1000	(CHAMPION) Operator Training Series.	66 Minutes
93	1	VS-2008	(CHAMPION) Standard Front Axle.	28 Minutes
94	1	VS-2018	(CHAMPION) Steering System Pressure Checks and Adjustments.	20 Minutes
95	1	VS-2009	(CHAMPION) Circle, Drawbar and Highlift.	27 Minutes
96	1	VS-2001	(CHAMPION) 8400 Transmission Disassembly/Reassembly.	12 Minutes
97	1	VS-2003	(CHAMPION) 8400 Transmission Clutch Packs.	13 Minutes
98	1	VS-2010	(CHAMPION) Clutch Housing Service.	34 Minutes
99	1	VS-2011	(CHAMPION) 13 1/2 inch Clutch Service.	24 Minutes
100	1	VS-9002	(CHAMPION) Engine-Cummins B Series Scheduled Maintenance.	25 Minutes
101	1	VS-9003	(CHAMPION) Engine-Cummins B Series Troubleshooting.	24 Minutes
102	2	VS-2022	(CHAMPION) SR-40 Final Drive.	27 Minutes
103	1	VS-2006	(CHAMPION) Single Reduction Final Drive (Series II).	19 Minutes
104	1	VS-3007	(CHAMPION) Oil Disc Brakes (SeriesIII) .	16 Minutes
105	1	VS-2015	(CHAMPION) Hydraulic Components.	47 Minutes
106	1	VT-1002	(CHAMPION) 700 Series Parts Manual System.	30 Minutes
107	1	VT-1003	(CHAMPION) Care and Storage of Spare Parts.	25 Minutes
108	1	VS-2019	(CHAMPION) Duramide Installation.	11 Minutes

CESE VIDEOS

ITEM	UNITS	PART NUMBER	TITLE	TIME
109	1	VS-9001	(CHAMPION) Engine- Cummins B Series Familiarization.	8 Minutes
110	1	VS-9004	(CHAMPION) Engine-Cummins B Series Fuel Pump.	7 Minutes
111	1	VIDEO-8754	(ROCKWELL) Seal and Yoke Instalation.	13 Minutes
112	1	VIDEO-89158	(ROCKWELL) Wheel Bearing Adjustment Procedures.	16 Minutes
113	1	VIDEO-90233	(ROCKWELL) Q and Q Plus Cam Brake Maintenance.	27 Minutes
114	1	VIDEO-90234	(ROCKWELL) Automatic Slack Adjuster Installation and Maintenance.	26 Minutes
115	1	VIDEO-90140	(ROCKWELL) Anti-Lock Brake System (ABS) for Trucks, Tractors&Trailers.	9 Minutes
116	1	VIDEO-8812	(ROCKWELL) Clutch Installation and Adjustment .	26 Minutes
117	1	VIDEO-8934	(ROCKWELL) Clutch Training Program.	74 Minutes
118	1	VIDEO-87124	(ROCKWELL) Parts Failure Analysis.	22 Minutes
119	1	VIDEO-9054	(ROCKWELL) Component Maintenance.	
120	1	VIDEO-90195	(ROCKWELL) Air System Troubleshooting. For the Rockwell 9&13 Speed Transmissions.	28 Minutes
121	2	PART-III	(FLUID POWER) Troubleshooting Hydraulics Part III.	12 Minutes
122	2	TO251	(TMC) Heavy Duty Cooling & Maintenance.	20 Minutes
123	1	TO305	(TMC) Tire Repair Failure Analysis.	20 Minutes
124	1	T-92108V	(ROCKWELL) Rockwell air Disc Brake Maintenance.	52 Minutes
125	1	3-795	(GROVE) The Real Key To Crane Safety.	22 Minutes
126	2	90194	(ROCKWELL) Driving the Rockwell 9&13 Speed Transmissions.	25 Minutes
127	2		(EATON FULLER TRANSMISSION) Professional Shifting	46 Minutes
128	1	TT00100	(VISTA) Transport Trailer Safety	
129	1	VS2012A-01	(CHAMPION) Engine Removal & Installation.	6 Minutes
130	1	VS2010A-01	(CHAMPION)Engine Clutch Housing Service.	34 Minutes
131	1	VS2011A-01	(CHAMPION) 13 1/2inch Engine Clutch Service.	24 Minutes
132	1	DGVHI95834	(JOHN DEERE) D-Series Backhoe Loader Safety, Maintenance & Operation	32 Minutes

CESE VIDEOS

ITEM	UNITS	PART NUMBER	TITLE	TIME
133	1	DGVHI94829	(JOHN DEERE) How Attachments Improve Backhoe Versatility	15 Minutes
134	1	SDD	Universal Joint Lube Path Demonstation	5 Minutes
135	3	15709859	ABS & SIR How they Work For You	24 Minutes
136	1		OPERATING TIPS Motor Grader	20 Minutes
137	1		OPERATING TIPS Track Type Tractors	15 Minutes
138	1		OPERATING TIPS Wheel Loaders	18 Minutes
139	1		OPERATING TIPS Push-Pull Scrapers	
140	1		OPERATING TIPS Elevating Scrapers	
141	1		OPERATING TIPS Hydrostatic Track Loader	16 Minutes
142	1		BASIC RIPPING (How, Why, & What)	18 Minutes
143	1		FUNDAMENTALS OF EARTHMOVING	20 Minutes
144	1		OPERATING GUIDE HYDRAULIC	19 Minutes
145	2	DGVHI97878	RIGGING AND LIFTING WITH CONSTRUCTION EQUIPMENT	30 Minutes
146	2	DGVHI95833	JOHN DEERE CONSOLIDATED SAFETY	114 Minutes
147	2	DGVHI89787	(JOHN DEERE) TAKING CONTROL OF YOUR MOTOR GRADER	19 Minutes
148	2	DGVHI95845	(JOHN DEERE) 690 EXCAVATOR MAINT, SAFETY AND OPERATION	38 Minutes
149	2	DGVHI94831	(JOHN DEERE) GRADER CIRCLE DRAFT/FRAME ADJUSTMENT	19 Minutes
150	2	710327	CAT 130G GRADER LEVEL A ROAD	12 Minutes
151	2	710326	CAT 130G GRADER CONSTRUCT "V" DITCH	12 Minutes
152	2	710332	CAT 621B SCRAPER SPREADING FILL	12 Minutes
153	2	700367	WHEELED SCRAPER LOADING WITH PUSHER	70 Minutes
154	1	700368	WHEELED SCRAPER LOADING AND SPREADING	18 Minutes
155	2	700365	WHEELED SCRAPER STARTING AND STOPPING PROCEDURES	10 Minutes
156	1	72043	CRAWLER TRACTOR STARTING AND STOPPING PROCEDURES	8 Minutes
157	2	72044	CRAWLER TRACTOR CHECK SWITCHES AND CONTROLS	16 Minutes
158	2	710325	CAT D7G STARTING AND STOPPING PROCEDURES	7 Minutes

CESE VIDEOS

ITEM	UNITS	PART NUMBER	TITLE	TIME
159	2	710324	CAT D7G MAINT. CHECKS AND SERVICES	10 Minutes
160	2	710323	CAT D7G CONSTRUCT A STOCKPILE	8 Minutes
161	2	710549	CAT D7G SPREAD A STOCKPILE	7 Minutes
162	2	710550	CAT D7G CONSTRUCT A DITCH	7 Minutes
163	2	702091	MAINTENANCE OPERATIONS IN SEVERE COLD WEATHER	24 Minutes
164	2	710712	STORING THE AUTOMOTIVE BATTERY	21 Minutes
165	2	700385	WIRE ROPE ATTACHMENTS AND SLINGS	19 Minutes
166	2	708402	UNLICENSED, UNTRAINED DRIVERS	
167	2	700311	SAFE DRIVING IN KOREA	13 Minutes
168	2	707719	SAFE DRIVING IN JAPAN	26 Minutes
169	2	709233	M939A2 SERIES CARGO TRUCK MAINT AND OPERATION	21 Minutes
170	2	701433	M939A2 SERIES CARGO TRUCK BRAKE SYSTEM	17 Minutes
171	2	709234	M931A2 SERIES WRECKER PMS AND OPERATION	37 Minutes
172	2	709184	OPERATION OF THE HMMWV	29 Minutes

MAIL ORDER FORM

BUILDER, CESE MAINTENANCE REPAIR, AND SHOP SAFETY TAPES

Video cassettes are available from the Seabee Logistics Center , Code 43RXC, 4111 San Pedro St. (Bldg. 1443), Naval Construction Battalion Center, Port Hueneme, California 93043-4301. Point of contact is
CMC CANO DSN 551-3157, COM (805) 982-3157
EO1 WHITE DSN 551-3328, COM(805) 982-3328

For FASTER SERVICE FAX to DSN 551-3395, commercial (805) 982-3395.

ITEM	PART NUMBER	TITLE

All orders will be processed upon receipt. Please allow Ample Time for Postal Service.

NAME (ALFA Company Commander A-6 / OIC) DSN # / COMM TEL #

NAME (Maintenance Supervisor A-4) RANK/RATE

COMMAND DSN # / COMM TEL #

ADDRESS FAX #

CITY STATE ZIP CODE

Signature (Maintenance Supervisor A-4) DATE

THIS SPACE FOR OFFICE USE ONLY

MAIL TO: Seabee Logistic Center
Code 43RXC
4111 San Pedro St. (Bldg. 1443)
Naval Construction Battalion Center
Port Hueneme, California 93043-4301

MAINTENANCE TIPS

Have clogged injectors and fuel lines put your vehicle down for the count too many times to remember?
Then you most likely have crud growing in your tanks. Crud comes from the gradual breakdown of fuel and the growth of microorganisms. Crud clogs injectors and fuel lines and plugs fuel filters.
The main culprit is water, whether from condensation, a leaky fuel cap, or contaminated fuel. If a vehicle's been stored very long, water always manages to get inside and those little microorganisms quickly go to work.
They attack fuel tank coating and sealant causing flaking and peeling, which makes for more clogs. They can also corrode fuel system surfaces, especially around tank filler necks.
Once crud forms, only a thorough fuel tank scrubbing will get it out.
After the system is clean, keep it clean with diesel fuel stabilizer additive. The additive comes on a 5-gal can, NSN 6850-01-246-6544, and a 55-gal drum, NSN 6850-01-246-6545. It slows fuel breakdown, kills microbial growth and inhibits corrosion.
Use one gallon of additive per 3,500 gallons of fuel, or three and a half ounces per one hundred gallons.
This additive won't dissolve crud that's already in the fuel tanks, but it will stop more crud from forming and kill all the microorganisms in your fuel.
Never put the additive in an empty fuel tank. It works best when added to a half-full tank just before you finish filling it.
If you use the additive without first cleaning the fuel tanks, keep a close eye on your fuel filters. As chunks of the crud break loose, filters can clog real quickly. Clean or change them often until the crud disappears.

DISC BRAKE LUBRICANT REMINDER

Never use petroleum based lubricants! Always use silicone-based brake lubricant on any metal or metal-to-rubber contact points in a disc brake system. Silicone lubricants have excellent temperature range capabilities and will not contaminate rubber components like petroleum-based lubricants. Key points to lubricate when performing a complete disc brake service are as follows:

- **Caliper bolts**
- **Rubber and Metal Bushings**
- **Metal Contact Points**

Properly lubricating the disc brake system will help assure all of the caliper components will continue to perform as designed and the disc pads will wear evenly and last longer. This will also help dampen vibration, which is the major cause of disc brake noise.
Use NSN 6850-00-702-4297, Silicone Compound.

KIT STOPS HYDRAULIC GUSHER

If you've been fighting a hydraulic fluid fountain when you retract the boom on your M936-series wrecker, here's good news.

Kit, NSN 2590-01-381-3570, moves the hydraulic tank vent from the return side of the tank to the outlet side. This kit lets you continue to use the old-style tank, but prevents the leaks caused by the vent being on the wrong side.

KEEP BREATHER VALVES CLEAN

A plugged breather valve is a death sentence for gearcases and axles on most medium and heavy trucks.

If the pressure that builds in those assemblies cannot escape, the seals blow. And when seals go, lube goes, too. No lube soon means no gears.

Keeping the breather valves clean is simple: Twist the valve's cap to loosen any dirt stuck inside.

Then pull up on the cap to make sure it's free. If the cap won't turn and pull up, get a new valve.

Make sure the new valve is good by blowing into the threaded end. If you can't easily blow through the breather, it won't do the job for your equipment. The cap on a good breather opens at a little under 1/2lb psi -almost no pressure at all.

Then give all breather valves the twist and pull test after each operation in mud or heavy dust your gearcase and axles will live longer if you do. (Don't forget the breathers near the wheels on the front axles.

2 ½ Ton and 5 Ton Trucks, Tire Side Rings

1. If you have ordered or received a tire side ring, NSN 2530-00-738-9061, Part Number 7389061, since January 1997 for your 5ton or 2 ½ ton truck, then this information is for you.
2. It has been reported that some stock has been mixed-up and you may have received the incorrect side ring. The first thing you need to do is examine the ring to make sure it has P/N 7389061, Cage Code 19207 and the manufacture cage code stamped on the outside of the ring, if you have all this information stamped on your ring, then you have the correct one. If it has just 20 X 7.5 FL 9-78 js, with a Firestone symbol stamped on it next to the number, without the part number and cage code stated above, then you have the wrong side ring. **DO NOT USE IT.**
3. If you suspect you have the wrong side ring, are not sure or just have a question pertaining to this side ring problem, Please contact one of the following personnel.

Mr. Wilhelm, DSN 850-2806, fax 850-1402/1610, Comm: (614) 692-2806, fax (614) 692-1402/1610, E-MAIL: C003934@DSCC.DLA.MIL.

Mr. Terry L. Callahan, DSN 786-7461, Comm: (810) 574-7461, E-MAIL: callahat@tacom.army.mil

NSN

M915 COOLANT FILTER KIT
Give your M915 tractor truck's engine a longer life by installing a coolant filter kit like the one used on the M915A1.
The filter keeps the cooling system clean and helps prevent corrosion.
Order the kit with NSN 2940-01-184-1877. Get replacement filters with NSN 4330-00-274-4712.

5-GAL PLASTIC FUEL CAN PARTS
Need some repair parts for your 5-gal plastic fuel can? The following parts were designed for the 5-gal metal fuel can, but they fit the plastic can, too.
Cap and screen assembly (includes flat washer, screen and cap) NSN 7240-00-132-6433.
Spout assembly (cap, screen, rubber gasket/bushing and nozzle) NSN 7240-00177-6154.
Flat washer NSN 5310-00-228-6638, Rubber bushing NSN 7240-00-132-6431, Gasket NSN 5330-00-298-7165, Closure assembly (includes gasket, chain, plug swivel, connecting link, and cotter pin anchor) NSN 7240-00-025-3377.

M939 FILTER CHANGE
The transmission oil cooler filter element for your M939-series and M939A1-series trucks is NSN 2940-01-110-2489. Make a note until item 17 of Fig 92 in TM 9-2320-272-20P is corrected.

TQG FUEL RETURN LINE
Use NSN 4720-01-411-4003 to get one meter of ozone resistant fuel return line for the diesel engines on your 5-KW and 10-KW tactical quiet generators. Cut to fit and install according to TM instructions.

M915A1 BRAKE DUST PLUGS
Use NSN 2530-010084-6975 to get dust plugs for the air brake chambers on M915A1 tractor trucks. The NSN is missing from Fig 89, 90 and 91 of TM 9-2320-283-24P.

5-TON HEATER SEAL
Use NSN 5330-01-108-9119 to get the seal for the air heater elbow on M939 and A1 series trucks. The seal is not shown separately with item 4, Fig 314 of TM 9-2320-272-20P.

WAIT LIGHT LABEL
NSN 7690-01-267-7370 gets a warning label for the dashboard on a CUCV or HMMWV. It says Warning: Do not start engine until WAIT light goes out.

FLEXIBLE EXHAUST EXTENSIONS

Keeping the cold outside is Job No. 1 when you're working in the maintenance bay, but make sure Job No. 2 is venting exhaust fumes outside.

Running vehicles indoors without venting is asking for trouble.

Run exhaust fumes safely outside by using flexible exhaust extensions.

NSN 4720-00-	INSIDE DIAMETER
174-4668	1 INCH
278-8030	1 ½ INCH
278-8027	1 ¾ INCH
278-8031	2 INCH
174-6818	2 ½ INCH
174-4664	3 INCH
174-4671	4 INCH

UNIT OF ISSUE IS FEET.

CARC PAINT

TWO-COMPONENT

COLOR	NSN 8010-01-			
KIT	1 ¼ QT	1 ¼ GAL	5 GAL	STD NO
GREEN	160-6741	162-5578	160-6742	383/34094
BROWN	160-6744	160-6745	1606746	383/30051
BLACK	141-2419	131-6254	131-6261	37030
SAND	141-2416	130-3347	131-6259	33303
TAN	260-0910	260-0909	260-0908	686A/33446
AIRCRAFT GREEN	141-2420	131-6255	131-6262	34031
AIRCRAFT RED	144-9884	144-9873		31136
FIELD DRAB	141-2414	130-3345		33105
EARTH YELLOW	141-2415	130-3346		33245
AIRCAFT YELLOW	247-8885	235-8059		33538
OLIVE DRAB	146-2650	055-2319	144-9875	34088
INSIGNIA BLUE		146-2648		35044
INTERIOR GRAY	170-7583	146-2649		36231
AIRCRAFT GRAY	144-9882	127-8908	144-9876	36300
AIRCRAFT BLACK IN	144-9886	146-2647		37031
AIRCRAFT BLACK	144-9885	146-2646	144-9879	37038
AIRCRFT WHITE	144-9883	144-9872	144-9877	37875

Paint kit consists of a polymer resin and a curing agent that must be mixed.

Single component

COLOR	1 QT	1 GAL	5 GAL	55 GAL
		NSN 8010-01-		
GREEN	229-7546	229-9561	229-7547	232-8514
BROWN	229-7543	229-7544	229-7545	233-0060
BLACK	229-7540	229-7541	229-7542	233-1568
SAND	234-2934	234-2935	234-2936	
TAN	276-3638	276-3639	276-3640	276-3641
AIRCRAFT GREEN	246-0717	246-0718	246-0719	

Single component already has curing agent added.

Keys

Equipment	Item	NSN
F5070 dump truck	switch with key	2540-00-609-8296
M915 series truck	ignition switch lock cylinder w/key key blank	2920-01-092-9134 2540-01-155-3601 5340-00-357-9269
621B scraper	disconnect switch key	5930-00-715-1939
130G grader	battery disconnect switch	2920-00-775-7691
D7G tractors	ignition switch key batt disconnect switch key	5340-01-257-6042 5930-00-715-1939
D8 tractor	batt disconnect switch key	5930-00-715-1939
MW24C scoop loader	key blank	5340-01-275-7751

RADIATOR HOSE PROTECTOR

If you've noticed that the top radiator hose on your HMMWV is taking hits from the drive belts, it's time to take some preventive measures.
Whether you reinstall a serviceable hose or put on a new one, add a clamp with shield, NSN 4730-01-194-2002, to prevent hose damage. Make sure the shield is on the bottom of the hose.

ANTISEIZE TAPE

You can dry up leaky water pipe joints with just a little antiseize tape.
There are two sizes of antiseize tape available. NSN 8030-00-889-3534 gets a roll of ¼ in tape for pipe threads measuring 1/8 to 3/8 in long. A roll of ½ in wide tape comes with NSN 8030-00-889-3535, for pipe threads measuring ½ in and longer.

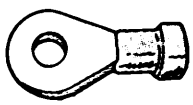
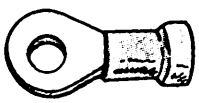
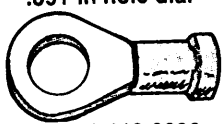
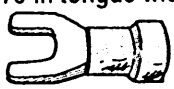
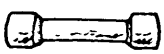
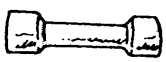
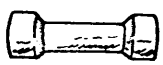
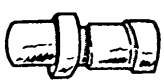
M939-,A1 SERIES STARTER

To get the starter for M939-series and M939A1-series trucks, use either NSN 2920-01-075-2813 or NSN 2920-01-069-6997. The starter shown as item 2 of Fig 44 in TM 9-2320-279-20p is no longer available.

ELECTRICAL TERMINAL NSNs

Electrical terminal kit, NSN 5940-00-525-0907, gets you 500 terminals (20 different types and sizes), a crimping tool, NSN 5120-00278-2423, and a storage box.

Don't order a whole new kit when you're running low on some of the terminals, though. Instead, use these NSNs to get replacements:

Ring terminal 18 AWG .144-in hole dia.  5940-00-204-8966	Ring terminal 18 AWG .201-in hole dia.  5940-00-143-4771	Ring terminal 14 AWG .147-in hole dia.  5940-00-113-8179	Ring terminal 14 AWG .190-in hole dia.  5940-00-143-4780
Ring terminal 14 AWG .266-in hole dia.  5940-00-230-0515	Ring terminal 10 AWG .201-in hole dia.  5940-00-143-4794	Ring terminal 10 AWG .266-in hole dia.  5940-00-143-4777	Ring terminal 10 AWG .391-in hole dia.  5940-00-113-9826
Spade terminal 18 AWG .144-in slot width .310-in tongue width  5940-00-833-1705	Spade terminal 14 AWG .144-in slot width .297-in tongue width  5940-00-539-2193	Spade terminal 14 AWG .201-in slot width .375-in tongue width  5940-00552-2019	Spade terminal 10 AWG .201-in slot width .380-in tongue width  5940-00-727-535
Spade terminal 18 AWG .144-in slot width .297-in tongue width  5940-00-938-5515	Butt connector 16 AWG  5940-00-143-5147	Butt connector 14 AWG  5940-01-232-8636	Butt connector 12-10 AWG  5940-01-079-1936
Disconnect tab 14 AWG  5940-00-378-7225	Quick disconnect receptacle 14 AWG  5940-00-926-0085	Quick disconnect tab 18 AWG  5940-00-867-9573	Quick disconnect receptacle 18 AWG  5940-00-436-1632

OPERATORS BE YOUR OWN INSPECTOR

Dozer

You've got to go over it step by step from front to rear. Use this checklist to get the job done.

FRONT END

Headlights, Working Lights - Glass cracked, broken, clouded ? Wires broken? Lenses loose? Lamps burned out? Mounting loose?
Radiator Grill- Bent in, mud caked, cracked? Broken hinges, pins missing?
Radiator- Fins bent, clogged with mud or foliage? Leaks? Low water level?
Blade Moldboard- Broken, loose or cracked welds?
Blade End Bits- Worn? Bolts missing?
Blade Cutting Edge - Worn? Bolts missing?

LEFT SIDE

Hydraulic Lines - Kinked, badly chafed, leaking or fittings loose?
Lift Cylinder - Any leaks? Bolts loose? Piston rod dry or scored?
Tilt Blade - Bent or loose?
Push Arm - Broken, cracked or mounting loose?
Trunnion - Loose? Bolts missing?
Body Nuts and Bolts - Loose or missing? Eyeball the track area where they're coated with mud, too.
Battery Box - Cover missing? Hinges broken or not lubed? Latches broken?
Batteries - Cracked or leaking? Terminals corroded or loose? Caps missing? Holddown loose or missing? Electrolyte low?

REAR END

Rear Flood Light - Glass broken or clouded? Wires broken or frayed? Mounting loose? Burned out?
Fuel Tank - Crushed? Leaking or rusty? Water in tank? Mounting bolts loose? Cap missing or loose? Gasket broken or missing? Strainer broken or missing?
Winch - Housing damaged or cracked? Cables kinked, broken strands, rusty or not oiled? Coupling damaged? Oil level low? Tow hitch pin missing? Loose mounting ?
Ripper - Shanks out of adjustment? Hydraulic hoses broken, worn, cracked or kinked? Hydraulic cylinders bent? Piston rod dry or scored? Gaskets leaking? Frame cracked or bent ? Pins worn missing or cracked or bent? Pins worn, missing or peening mounting bracket stud nuts missing or loose?

RIGHT SIDE

Dozer Hydraulic Tank - Filler screen broken? Gasket missing or deteriorated? Cap missing or oil low? Filter cover assembly cracked? Screws or bolts missing?

Front Crankcase Guard - Cracked or broken? Bolts missing? Pull hook broken or mounting loose? Debris in guard?
Exhaust - Loose? Uncovered when tractor is stored outdoors? Flutter valve sticks?
Rear Crankcase Guard - cracked or broken? Bolts missing? Access cover broken, missing or loose? Debris in guard?
Tilt Cylinder- Leaks or bolts loose? Piston rod badly scored or dry?
Track Frames - Cracked or loose? Missing bolts? Broken parts? Mud-packed?
When walking around your dozer look for wet spots, dangling wires and broken or missing parts.

NO MUD NO CRUD

Operators make sure all the mud on your dozer is washed off. Two areas that need special attention are the track and carrier rollers, and the rock guard on the blade's tilt cylinders.
The dozer's track and carrier rollers take a lot of abuse during operation.
Feel for loose cap bolts and look for lube stains or metal discoloration on the housing.
Loose bolts means dirt gets in – and lube leaks out.
The rock guard on the dozer blade's tilt cylinder is a haven for mud, small rocks, dirt and sand.
All the crud breaks down the hydraulic hoses inside the rock guard.
Use a high pressure hose to clean the tilt cylinder's rock guard. You may have to remove the rock guard so you can get out all that hard packed crud.

ROCK IN ROCK OUT

A rock lodged between your tractor's sprocket segment gear mounting bolts and the final drive housing can wear a hole in the housing PDQ.
So, keep the rocks out and when you're working in sticky, heavy dirt, clean out the crud around the track after each operation.
Never let your tractor sit long with packed in mud, rocks and debris. That stuff hardens like cement. Then you can't get it out without tearing up more track parts.

GRADER

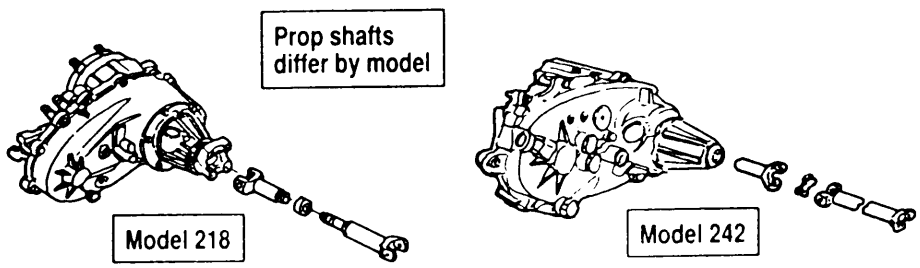
MOLDBOARD SLIDE BUSHING

There is no wear limit criteria or check in the TMs for the moldboard's slide bushing.
When the bushing wears out, the moldboard's slide cylinder starts to shift and drop.
Eventually, the weight of the grader's blade puts too much strain on the cylinder. That damages the cylinder seal and causes it to leak.
To head off this damage, eyeball the brackets that hold the moldboard in place. The brackets are located at both ends of the blade.
There should be at least 1/8 inch between the moldboard and the bracket. Less than that means the slide bushing is shot. Your must replace it.

HMMWV

TRANSFER CASE

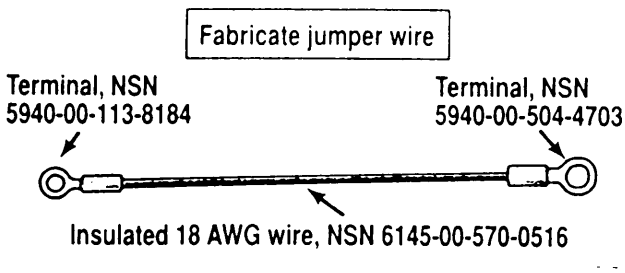
Now that there's a new transfer in the supply system for all basic HMMWV models except the M1097, you'll need to be extra careful when you order front and rear propeller shafts.
The old model 218 transfers are no longer in production. They've been replaced by model 242 transfers. Prop shafts that work with the model 218 transfer won't work with the model 242, and vice versa.
If your basic model HMMWV (other than the M1097) has the model 242 transfer, check the TM to make sure that you order front and rear prop shafts that carry the usable-on code (UOC) "BVY" in the parts manual, or the prop shafts that the parts pub says are to be used with transfer case, PN 12447125.
The old transfer is good to go until it breaks, but use only prop shafts that the parts pub calls out for use with transfer case, PN 12340073. When you order the old transfer, the supply system will send you a kit, USN 2520-01-434-0822, to replace it. The kit contains the 242 transfer, necessary prop shafts, hardware and instructions.

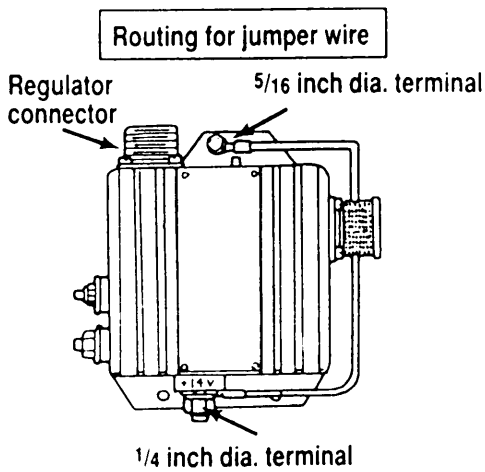


ALTERNATORS

Original equipment alternators (100-and 200-amp) for your HMMWV are no longer available.
Their replacements, NSN 2920-01-407-0532 (100-amp) and NSN 2920-01-420-9968 (200-amp), are the dual-voltage alternators used on A2 and M1113/M1114 expanded capacity models that have electronic controlled transmissions.
These new alternators (and the regulator that go with them) will be used on all HMMWVs once the older ones are used up.
To use them with basic and A1 model HMMWVs, which are single voltage systems, however, you must ground the +14V terminal of the 100-amp dual voltage regulator, NSN 2920-01-429-9591 and the 200-amp dual voltage regulator, NSN 2920-01-415-9497.

1. Fabricate a ground jumper wire. You need a 9 ¾ in piece of AWG 18 wire, NSN 6145-00-570-0516, and two terminals. Terminal NSN 5940-00-113-8184 and terminal NSN 5940-00-504-4703.
2. Hook up wire 2A to the AC terminal and wire 3B to the alternator ground.
When installing a 100-amp dual voltage alternator, hook up wire 568A to the ignition/energize terminal and wire 5A to the alternator's positive terminal.
When installing the 200-amp dual voltage alternator, hook up wire 5A to the ignition/energize terminal and wire 6E to the alternator's positive terminal. Wire 568 gets tied back and plugged.
3. If you are installing a dual voltage regulator on a single voltage alternator, leave the cap on the phase connector since it is not used. If you are installing a dual voltage regulator on a dual voltage alternator, keep the phase connector connected to the alternator.
4. Connect the jumper wire from the +14V regulator terminal to the alternator ground terminal. Use the original hardware, torquing the +14V end to 90 in-lbs and the ground end to 30 in-lbs.





BRAKE SWITCH

If the stoplight switch on HMMWV' is not adjusted right, a light touch on the brake pedal may not make the stoplights come on, leaving your rear a target for following traffic.
So check to see if your stoplights work as designed.
The stoplight should come on within ¼ in of pedal travel.
If the lights don't come on until the pedal's depressed more than ¼ inch, do some stoplight switch maintenance.
The adjustment info for basic and A1 models is on Pages 4-98 and 4099 of TM 9-2320-280-20-2.
For A2 models, see Pages 4-100 and 4-101.
Note that the reference to ½ inch of pedal travel on Page 4098 is incorrect.

Unauthorized use of Commercial Types of Antifreeze

Currently, there are two kinds of non-arctic antifreeze in the Army supply system, Antifreeze, Ethylene Glycol, Inhibited, Heavy Duty, Single Package, MIL-A-46153 (three NSNs), and Commercial types of antifreeze with basic part numbers of A-A-870 and O-A548 (two NSNs). Both kinds of antifreeze have their intended use. Commercial type antifreeze is intended to be used in GSA administrative, transportation, service, and commercial types of vehicles only. MIL-A-46153 is a heavier duty type antifreeze that is formulated specifically for use in tactical, combat and some construction type vehicles that are alternately stored for long periods then used unmercifully in very severe environments and then stored again.

The problem is that some folks are using commercial antifreeze in tactical and combat vehicles because they think it is some how better than MIL-A-46153.

The commercial types of antifreeze have better aluminum corrosion inhibitor characteristics than MIL-A-46153, and therefore are being used in place of MIL-A-46153 for that reason. Extensive testing at TARDEC and Ft. Belvoir has not shown aluminum corrosion to be a problem in properly maintained equipment using MIL-A-46153. The commercial antifreeze should be the preferred choice for use in commercial type vehicles where a large percentage of engine components are aluminum.

The additive package of stabilizers and buffing compounds give MIL-A-46153 superior long term storage and severe service performance that commercial antifreeze does not provide. Few components of heavy-duty military type engines are aluminum. MIL-A-46153 is the logical choice and is the only non-artic type antifreeze authorized for use in tactical, combat and some construction equipment for that reason.

As an added bonus, a 55-gallon drum of MIL-A 46153 only costs $197.39(Army Log price). The commercial stuff (A-A-870 or O-A-548) cost $318.00 (Army Log price) a drum.

MIL-A-46153	UNIT OF ISSUE	PRICE	A-A-870 O-A-548	UNIT OF ISSUE	PRICE
6850-00-181-7940	55 GAL	$197.39	6850-00-664-1409	55 GAL	$318.00
6850-00-181-7933	5 GAL	$23.85			
6850-00-181-7929	1 GAL	$6.38	6850-00-664-1403	1 GAL	$6.80

ESSENTIALUBE USERS

CBC Port Hueneme, CA has a limited amount of additive Essentialube in stock. Once quantities indicated below are depleted it will no longer be stocked at CBC.

9150-LL-LCD-0122	(20 gal drum)	6 @ $223.84 per drum
9150-LL-LCD-0121	(35 gal drum)	8 @ $363.72 per drum
9150-LL-LCD-0123	(2 gal can)	36 @ $25.90 per can
9150-LL-LCD-0124	(quart)	197 @ $3.67 per qt

Use RID P96, 0N COG on your requisitions if you wish to take advantage on this offer.

Technical Service Information

INTERNATIONAL®

Subject File: ENGINES

Subject: Releasing new cylinder head oil rail end plug and seal package.

Models: T 444E

Description: The cylinder head oil rail end plug, back up ring and O–Ring are no longer serviced separately. A new service package containing a new end plug, back up ring and O–Ring has been created.

Ordering Information:

Parts Affected

Part Number	Description	Displaced Part
1 827 535 C91	Cylinder Head Oil Rail End Plug Package (Consists of an end plug, back up ring and O–Ring.)	
	Oil Rail End Plug	1 818 186 C1
	Back Up Ring	1 814 546 C1
	O–Ring	1 815 873 C1

Installation Instructions:

Perform the following steps when replacing the cylinder head oil rail end plug.

1. Remove and discard end plug, back up ring and O–Ring from cylinder head.
2. Using a clean, dry, lint free cloth and brake cleaner, clean cylinder head internal threads of dirt, loose particles and any foreign material. Dry thoroughly with a clean dry lint free cloth.

CAUTION

TO ASSURE A PROPER SEAL, BE SURE TO PREVENT ANY FOREIGN MATERIAL OR BRAKE CLEANER FROM GETTING INTO THE OIL RAIL PASSAGE.

3. Lubricate new back up ring (**2, Figure 1**) and new O–Ring (**3, Figure 1**) with clean engine oil prior to installation onto new end plug (**1, Figure 1**). Install back up ring and O–Ring onto end plug as shown in **Figure 1**.

CAUTION

TO ASSURE A PROPER SEAL, BE CAREFUL, NOT TO GET ENGINE OIL ONTO THREADS OF END PLUG (1, FIGURE 1).

4. Apply a small bead of Loctite® #277 around the threads of the new end plug (**1, Figure 1**).
5. Install end plug into cylinder head oil rail port. Torque to 81 Nm (60 lbf–ft.)

CAUTION

DO NOT START ENGINE FOR A MINIMUM OF ONE (1) HOUR. THIS ALLOWS THE LOCTITE® TO CURE.

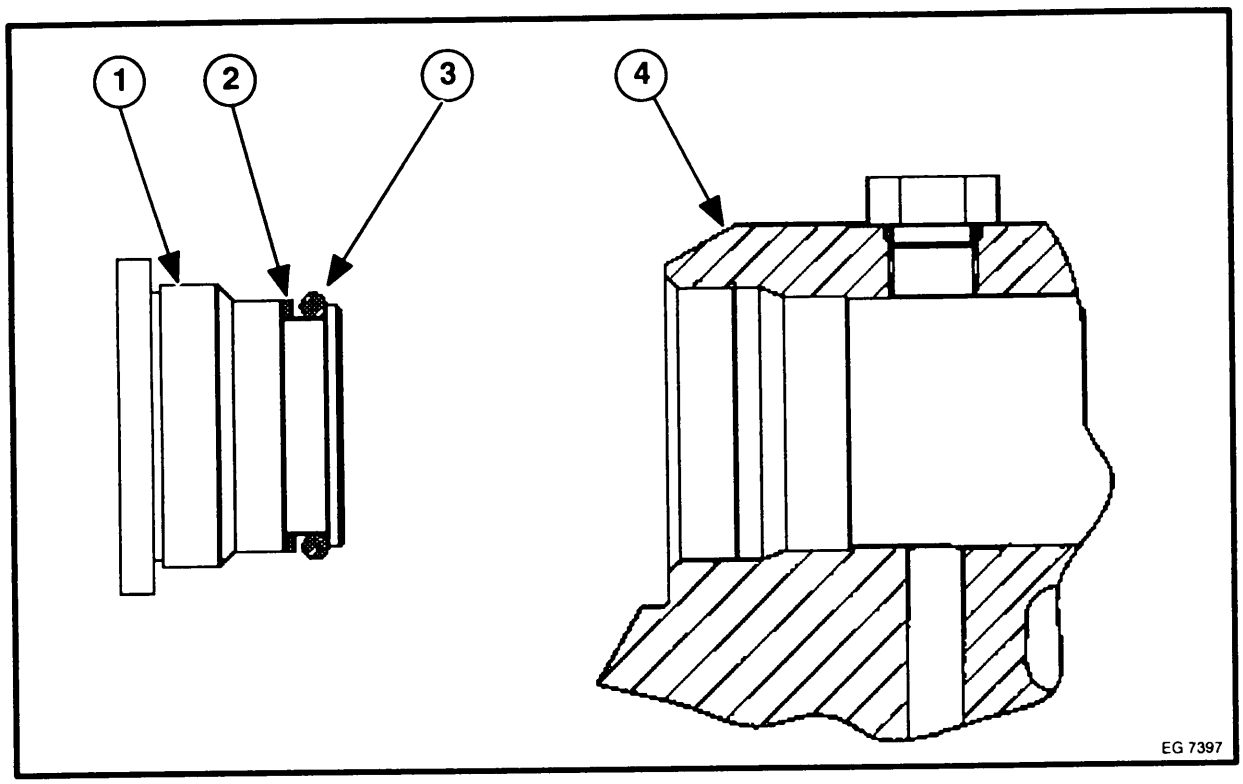


Figure 1 Back Up Ring And O–Ring Locations On Cylinder Head End Plug

1. **Cylinder Head Oil Rail End Plug**
2. **Back Up Ring**
3. **O–Ring**
4. **Cylinder Head**

NOTE: Keep a copy of this bulletin with Service Manual EGES 120, until an updated version is available.

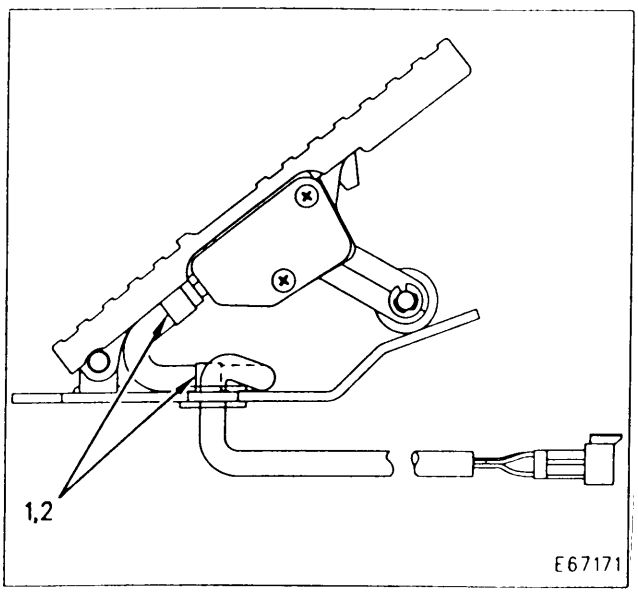
Installation of Clip Improves Throttle Pedal Sensor Service Life

1265-P9, 7553

834B (7BR) Wheel Tractors; 836 (7FR) Landfill Compactors; 988F Series II (2ZR) Wheel Loaders

Description Of Change: A clip can be installed onto the pedal that will secure the throttle pedal wire harness. Without the clip the wire harness is able to move, resulting in wire deterioration. Installation of this clip will increase the service life of the wire harness.

Adaptable To: 160-6366 Clip (1) and 160-6365 Screw (2) are effective with 988F Series II (2ZR1157-Up) Wheel Loaders, and are adaptable to first production for all other machines listed.



130-8176 Pedal
(1) 160-6366 Clip. (2) 160-6365 Screw.

Transmission Control Group Switches Are Now Serviceable

3065, 1400

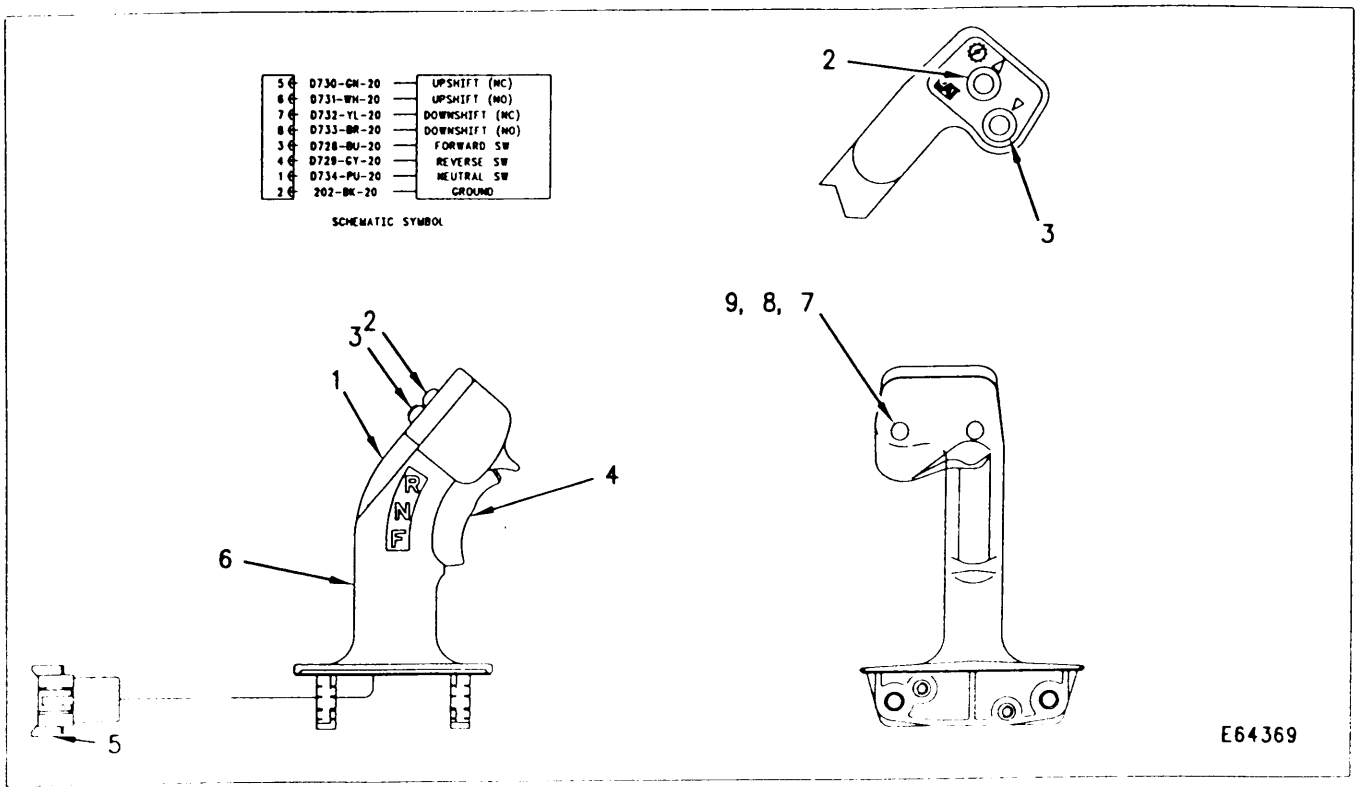
988F Series II (2ZR) Wheel Tractors;

Description Of Change: A new transmission control group STIC (Steering Transmission Integrated Control) is now available featuring individually serviceable upshift, downshift & directional switches.

Adaptable To: The new 159-8661 STIC Control Group is a direct replacement for the former 117-0298 and 136-1155 STIC Control Groups. The new 159-8662 Cap Assembly is a direct replacement for the former 136-1153 Cap Assembly.

Refer to the chart for a list of service repair parts for the new 159-8661 STIC Control Group.

Service Repair Parts For The New 159-8661 STIC Control Group		
No.	Part No.	Description
1	159-8662	Cap Assembly
2	159-8665	Upshift Switch
3	159-8664	Downshift Switch
4	159-8663	FNR Switch Assembly
5	160-3518	Receptacle Kit
6	105-9073	Grip
7	7Y-3173	Screw
8	8C-7508	Lockwasher
9	8C-9660	Washer



159-8661 STIC Control Group

Refer to the following chart for a partial list of effective serial numbers on the improved 159-8661 STIC Control Group. The 159-8661 STIC Control Group is adaptable to first production for all machines listed at the beginning of the article.

Production Effectivity	
Sales Model	Serial Number
844	2KZ00298 - Up
854G	1JW00235 - Up
988F Series II	2ZR01387 - Up
990 Series II	4FR00353 - Up
992G	7HR00234 - Up

Circuit Breakers are changing from Red to Blue Reset Buttons

1420

Machines And Other Caterpillar Products Using Listed Red Circuit Breakers

Description Of Change: Circuit breakers on Caterpillar products are changing from red to blue reset buttons to comply with international standards. The red reset button circuit breakers will no longer be serviced. When ordering red reset button circuit breakers, blue reset button circuit breakers of the same current rating will be received.

Adaptable To: The new blue breaker assemblies (reset buttons) are direct replacements for the former red breaker assemblies (reset buttons). See the chart for replacement part numbers.

Replacement Circuit Breaker Buttons	
New Blue Breaker Assembly	Former Red Breaker Assembly
6T-3642	9G-9487
6T-3643	6N-8589
6T-3644	3T-8728
9Y-0951	5M-2555
6T-3645	9S-0173
135-8720	6F-5640
9S-4693	6T-3646
6T-6210	101-3843
3E-7294	111-9123
135-7893	7T-9251

■

Seat Roller Service Kit Available

7324

613C (8LJ), 615C (9XG), 621F (4SK, 8PL), 623E (5SG) 623F (6BK), 627F (1DL, 4YK), 633E (2PS), 651E (4YR, 5XR), 657E (6TR, 7KR, 5YR, 6PR) Wheel Tractors

A new roller kit provides a better fit with the upper and lower housings of machine seats. The new 149-0732 Roller Kit is used on the 133-2017 Seat Suspension found on some wheel tractors.

Note: Do not use the 123-9128 Roller Kit on the 133-2017 Seat Suspension.

■

New Pilot Valve Improves Steering Control

4342

988F (8YG, 2ZR), 990 (7HK, 4FR), 992D (7MJ), 992G (7HR) Wheel Loaders

Description Of Change: A new pilot valve replaced the former pilot valve for steering control. The new pilot valve improves steering operation, control, and stability. Noise is also reduced.

Adaptable To: New 143-2855 Pilot Valve (1) replaced former 6E-3182 Pilot Valve (2), effective with 988F (2ZR774), 990 (4FR249), and 992G (7HR46) Wheel Loaders.

New 143-2855 Pilot Valve (1) is adaptable to first production for earlier 988F (2ZR), 990 (4FR), and 992G (7HR) Wheel Loaders.

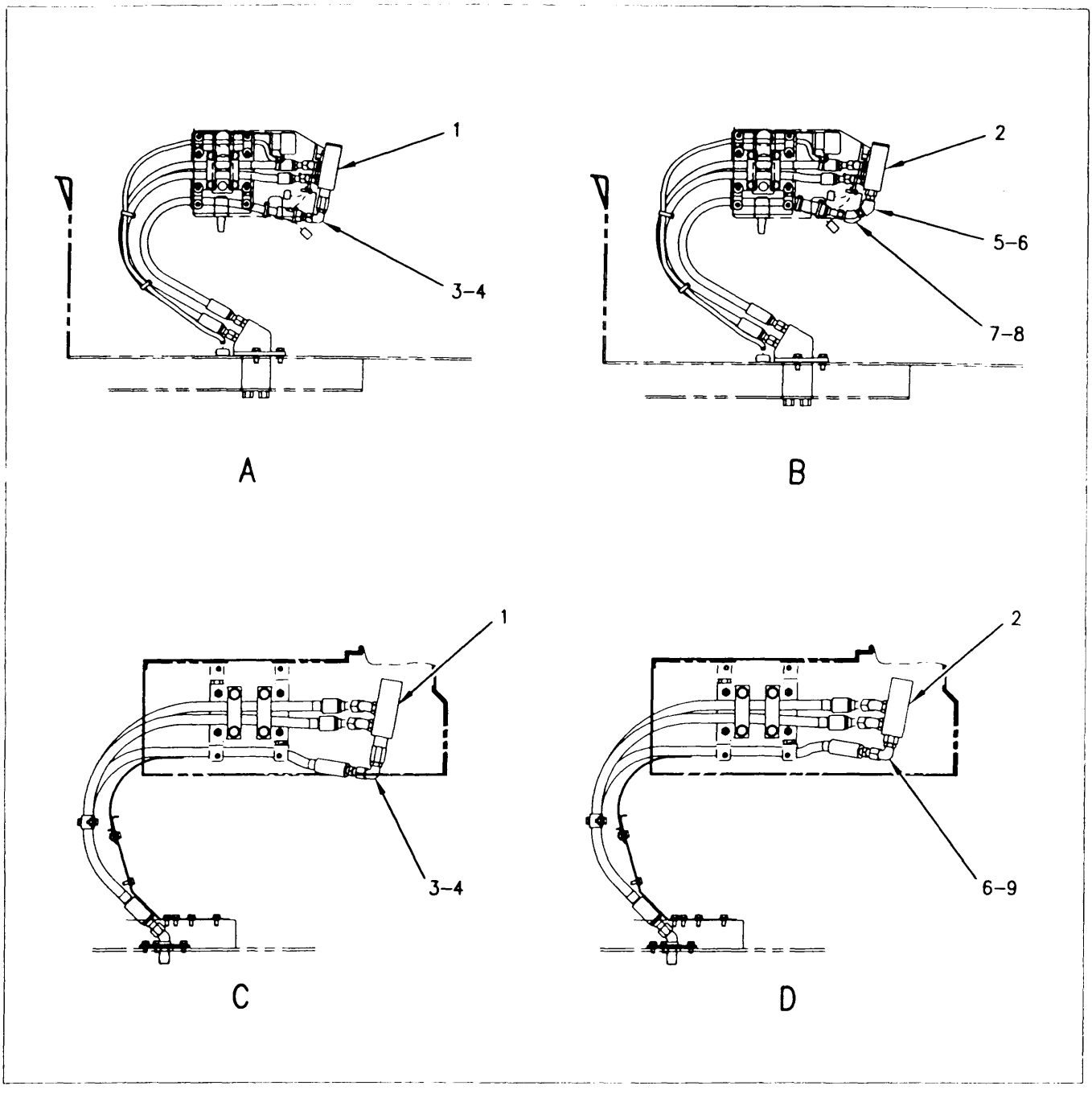
New 143-2855 Pilot Valve (1) is also adaptable to 990 (7HK1-Up), 988F (8YG1-Up), and 992D (7MJ1-Up) Wheel Loaders.

Note: Installation of new 143-2855 Pilot Valve (1) requires changing fittings and seals.

See illustration for service parts.

Note: Apply equal torque to mounting bolts for new 143-2855 Pilot Valve (1) to prevent distorting the valve body.

Note: Important - use an 11/16" open end wrench on the handle of the valve to secure the joystick locknut. Otherwise side loads can be transferred to the valve plungers, contributing to sticky operation.



Typical Steering Controls
(A) Improved 4E-6403 and 130-1830 Steering Controls. (Not serviced)
(B) Earlier 4E-6403 and 130-1830 Steering Controls. (Not serviced).
(C) Improved 4E-8412 and 124-9762 Steering Controls. (Not serviced)
(D) Earlier 4E-8412 and 124-9762 Steering Controls. (Not serviced)
(1) New 143-2855 Pilot Valve
(2) Former 6E-3182 Pilot Valve
(3) Two 6V-8625 Elbows.
(4) Two 3K-0360 O-Ring Seals
(5) Two 9X-2085 Elbows.
(6) Two 3J-1907 O-Ring Seals
(7) Two 8C-8989 Elbows
(8) Two 6V-8398 O-Ring Seals
(9) Two 8T-6876 O-Ring Face Elbows

■

Addition of Check Valve Improves Trailing Unit Control Group

5057, 5321

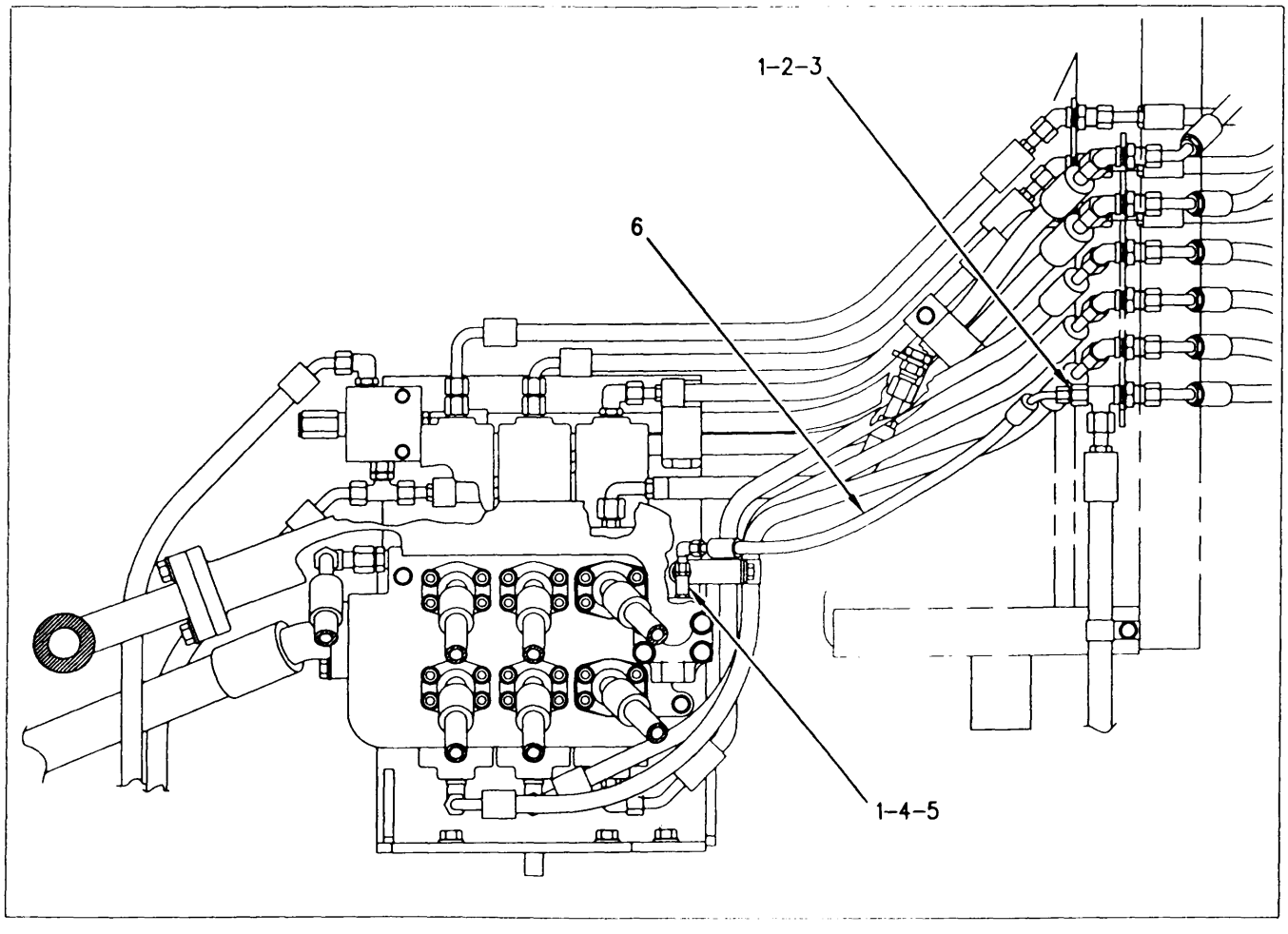
621F (4SK), 627F (1DL) Wheel Tractor-Scrapers

Reference: Service Magazine, SEPD0403, February 16, 1998; Page 15; "Vent Line Added To Carry Check Valve To Prevent Inadvertent Drop Of Scraper Bowl".

Description Of Change: A check valve and vent line has been added to the trailing unit control group to prevent the scraper bowl from dropping when trying to modulate after a long haul with a loaded bowl

Adaptable To: The changes to the 8X-4966 Trailing Unit Control are effective with 621F (4SK780) and 627F (1DL555) Wheel Tractor Scrapers. To adapt earlier machines, see the referenced Service Magazine.

Serviced Parts Changes for 8X-4966 Control Group-Trailing Unit				
Item	Former Qty.	New Qty.	Part Number	Description
1	18	21	6V-8397	O-Ring Seal
2	22	23	6V-8398	O-Ring Seal
3	1	2	6V-8936	Reducer Assembly
4	0	1	6V-9850	Swivel Elbow
5	0	1	9T-3096	Check Valve Group
6	0	1	159-0071	Hose Assembly



View of 8X-4966 Trailing Unit Control.

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Article No. 95-5-22	• ACCESSORY DRIVE BELTS—ALL 7.3L IDI DIESELS—COME OFF ACCESSORY DRIVE PULLEYS—VEHICLES BUILT AFTER 2/15/92 • ENGINE—ALL 7.3L IDI DIESELS—FRONT END ACCESSORY DRIVE MISALIGNMENT—FEAD BELT TRACKING ISSUES—VEHICLES BUILT AFTER 2/15/92

LIGHT TRUCK: 1992-94 ECONOLINE, F-250, F-350, F-47

This TSB article is being republished in its entirety to include the latest level parts and to update the service procedure.

ISSUE: Some diesel-powered vehicles are experiencing drive belt tracking concerns. This is caused by Front End Accessory Drive (FEAD) misalignment, which may result in the belt coming off the accessory drive pulleys. If this occurs, several warning lights will illuminate and the vehicle will lose generator and A/C function and water pump circulation. In addition, steering efforts will increase and, after one or a few brake applications, brake efforts will progressively increase.

ACTION: Check and align the FEAD. Replace worn pulleys, A/C-P/S-V/P (air conditioner - power steering - vacuum pump) bracket and tensioner and install rubber-backed belts. Refer to the following Service Procedure for details.

SERVICE PROCEDURE

REMOVAL

1. Disconnect the battery negative leads from all batteries.

NOTE: COMPONENTS INSTALLED BY FINAL STAGE VENDORS ARE NOT INCLUDED. REMOVE THOSE COMPONENTS AS NECESSARY TO CHANGE THE A/C, P/S AND V/P BRACKETS.

2. Remove the air intake tube on F-Series. Also, reduce coolant and remove the radiator top water hose.

3. Remove the fan, clutch and shroud (LH thread on fan clutch nut). Use Fan Clutch Pulley Holder T83T-6312-A and Fan Clutch Nut Wrench T83T-6312-B.

4. Remove the belt from the tensioner and discard.

5. Remove the vacuum pump and power steering pulleys using Steering Pump Pulley Remover T69L-10300-B.

6. Remove the A/C compressor, vacuum pump and power steering pump from the bracket.

NOTE: IT SHOULD NOT BE NECESSARY TO BREAK ANY HOSE CONNECTIONS.

7. Remove the bracket, tensioner and routing idler from the cylinder head.

INSTALLATION

1. Install the A/C-P/S-V/P bracket (F4TZ-19E708-D) to the cylinder head. Tighten the three (3) fasteners to 47.5 N·m ±7.2 N·m (35 lb-ft ±5 lb-ft). Refer to Figure 1.

2. Install the tensioner (F4TZ-6B209-C) using the T50 Torx bit and tighten to 62 N·m ±9.4 N·m (46 lb-ft ±7 lb-ft). The sub-bracket is attached to the flange on the main bracket adjacent to the vacuum pump location. Use two (2) new bolts (N605906-S2) and nuts (N620481-S2) and torque to 27 N·m ±4 N·m (20 lb-ft ±3 lb-ft).

NOTE: THE TENSIONER LOCATING PEG MUST BE IN THE BRACKET HOLE BEFORE TIGHTENING THE TORX BOLTS.

3. Reinstall the vacuum pump. Tighten the three (3) bolts with a 10mm socket to 27.5 N·m ±4.2 N·m (20 lb-ft ±3 lb-ft).

4. Reinstall the power steering pump. Tighten the three (3) bolts with a 17mm socket to 47.5 N·m ±7.2 N·m (35 lb-ft ±5 lb-ft).

5. Reinstall the A/C or non-A/C idler pulley and torque to 27.8 N·m ±4.2 N·m (20 lb-ft ±3 lb-ft).

6. Reinstall the belt routing idler and torque to 55 N·m ±8.3 N·m (40 lb-ft ±5 lb-ft).

• **ACCESSORY DRIVE BELTS—ALL 7.3L IDI DIESELS—COME OFF ACCESSORY DRIVE PULLEYS—VEHICLES BUILT AFTER 2/15/92** • **ENGINE—ALL 7.3L IDI DIESELS—FRONT END ACCESSORY DRIVE MISALIGNMENT—FEAD BELT TRACKING ISSUES—VEHICLES BUILT AFTER 2/15/92**	**Article No. 95-5-22 Cont'd.**

NOTE: VERIFY THAT THE PULLEY IS CROWNED: F4TZ-8678-A. REFER TO FIGURE 1.

7. Reinstall the vacuum pump and power steering pulleys so that the pulley hub is flush to the end of the shaft 0.00 ±0.10″ (0.00 ±0.25 cm). Use Steering Pump Pulley Replacer T65P-3A733-C.

8. Verify assembly sequence of Navistar shims (E3TZ-6B306-A) 0.090″ (2.3mm) at crankshaft-water pump pulleys, refer to Figure 2. The preferred assembly is with a pulley ring (E3TZ-6B306-A) in front and in back of the crank pulley and the spacer plate in front of the water pump pulley, only. Tighten to 32.5 N·m ±3 N·m (24 lb-ft ±2 lb-ft).

9. Install the new rubber-backed belt (F4TZ-8620-T with 130 AMP generator; F4TZ-8620-L with 165 AMP L/N generator) according to the belt routing decal.

   a. Loosely route the belt over all pulleys except the routing idler. Refer to Figure 2.

   b. Assure that the belt fits correctly in all grooved pulleys.

   c. Swing the tensioner to the installed position and slip the belt over the routing idler.

   d. Reinspect the belt fit on all pulleys.

10. Reinstall the fan/clutch and shroud using Fan Clutch Pulley Holder T83T-6312-A and Fan Clutch Nut Wrench T83T-6312-B.

    a. Tighten clutch nut to 133 N·m ±20 N·m (98 lb-ft ±15 lb-ft).

    b. Tighten the four (4) shroud bolts to 6.5 N·m ±1.5 N·m (5 lb-ft ±1 lb-ft).

11. Resecure the top water hose. Tighten to 3.73 N·m ±.61 N·m (33 lb-in ±5 lb-in).

12. Reinstall air intake tubes. Tighten to 9.0 N·m ±1.4 N·m (80 lb-in ±12 lb-in).

13. Service the coolant system.

Article No. 95-5-22 Cont'd.	• ACCESSORY DRIVE BELTS—ALL 7.3L IDI DIESELS—COME OFF ACCESSORY DRIVE PULLEYS—VEHICLES BUILT AFTER 2/15/92 • ENGINE—ALL 7.3L IDI DIESELS—FRONT END ACCESSORY DRIVE MISALIGNMENT—FEAD BELT TRACKING ISSUES—VEHICLES BUILT AFTER 2/15/92

FEAD ALIGNMENT PROCEDURE	
ITEM	**PROCEDURE**
Check water pump pulley diameter and fan clutch.	The correct water pump pulley is stamped 1816349C1 on the front of the pulley under the reinforcing spacer. Some vehicles built from 8/93 through 11/93 had a smaller pulley that prevents the tensioner from operating in range. (Ref. ONP 93B34). Turbo fan clutches should have F3TA-HA stamped on the flat of the clutch nut. If you have an F4TA-HA, replace it with an F3TA-HA. Naturally aspirated should have F2TA-JA stamped on the flat of the clutch nut. **NOTE: BIMETAL IS IN THE FRONT COVER NOTCH SO THAT IT IS OPERATIONAL. SYSTEMS WITH INOPERATIONAL BIMETALS ARE OVERSTRESSED.**
Check that the belt is fully supported on the routing idler and tensioner idler.	Changes in the belt tracking are made by adding crankshaft shims from Shim Kit (F2TZ-6B306-E) to the reinforcing plate to move the belt forward. Replacing the plate with shims moves the belt back as it enters the idler pulley. Ensure fan pulley spacer is mounted in front of the pulley, see Figure 1. **NOTE: There is no plate behind the water pump pulley.** Both idler pulleys may adversely affect belt tracking if symmetrically worn. If the idler pulley diameter is less at one (1) edge than the other, replace it with a new Idler Pulley (F4TZ-8678-A). To minimize recurrence, replace the belt with a rubber-backed belt (F4TZ-8620-T for the 130 amp generator or F4TZ-8620-L for the ambulance prep package application).
Check the generator bracket for mis-build.	For vehicles with 130 amp generators: The prefix F3TA is visible on the bottom of the generator bracket on F-Series vehicles, F3UA is visible on the bottom of the generator bracket on Econoline vehicles. Refer to Figure 2. F3TA parts are shorter than F3UA parts and rely on a fuel filter bracket to locate the generator correctly in the sheave. Incorrect combinations result in the belt mistracking at the A/C compressor.
Check the generator bracket for spacers.	For vehicles with 165 amp L/N (Ambulance Prep Pkg.): E4TA for F-Series; E4UA for Econoline generator bracket. Additionally, three (3) spacers separate the bracket from the cylinder head or fuel filter bracket. They are the same for both applications. Replace the spacers if missing. See Figure 2. A stamped steel sub-bracket attaches in back of the mounting tab at the top of the generator. Verify that it is not in front of the generator mounting tab. Replace the sub-bracket if it was misinstalled. Verify that the vacuum pump pulley hub is flush with the end of the pump shaft.

- **ACCESSORY DRIVE BELTS—ALL 7.3L IDI DIESELS—COME OFF ACCESSORY DRIVE PULLEYS—VEHICLES BUILT AFTER 2/15/92**
- **ENGINE—ALL 7.3L IDI DIESELS—FRONT END ACCESSORY DRIVE MISALIGNMENT—FEAD BELT TRACKING ISSUES—VEHICLES BUILT AFTER 2/15/92**

Article No. 95-5-22 Cont'd.

FEAD ALIGNMENT PROCEDURE	
ITEM	**PROCEDURE**
Verify that the A/C compressor is correctly aligned. Measure the mounting bolt boss height. The correct boss height is 93mm.	If the height is 83mm, then replacement of the compressor is necessary. The bolt torque is 27.5 N·m (20.3 lb-ft).
	Compressor clutch pulleys may be forward of design position. Loosen the four (4) M-8 fasteners and push the compressor rearward to correct. A straightedge across the generator and A/C pulleys helps to prevent skew to the sheaveline. See Figure 3.
Rapid engine decelerations.	A belt (F4TZ-8620-T) for the 130 amp generator, and a longer belt (F4TZ-8620-L) for the 165 amp L/N generator ambulance package reduces these tracking issues. See Figure 1.
	Smooth operation of the throttle during the first five (5) minutes after initial startup will permit the cooling fan clutch to decouple "morning sickness" and reduce FEAD decel activity.
	Loading the power steering pump to bypass mode during these decels is not a recommended vehicle operating practice.

PART NUMBER	PART NAME
F4TZ-6B209-C	Tensioner
F4TZ-19E708-D	A/C-P/S-V/P Bracket (For 1992-93 Model Years)
N605906-S2	Bolt
N620481-S2	Nut

PART NUMBER	PART NAME
F4TZ-8678-A	Idler Pulley
F4TZ-8620-T	Drive Belt (130 Amp Generator)
F4TZ-8620-L	Drive Belt (165 Amp L N Generator - 1994 Models)
F2TZ-6B306-E	Shim Kit
E3TZ-6B306-A	Shim (0.090")

THE FOLLOWING PARTS SHOULD BE PURCHASED ONLY IF FEAD BELT ALIGNMENT IS REQUIRED:

Article No. 95-5-22 Cont'd.	• ACCESSORY DRIVE BELTS—ALL 7.3L IDI DIESELS—COME OFF ACCESSORY DRIVE PULLEYS—VEHICLES BUILT AFTER 2/15/92 • ENGINE—ALL 7.3L IDI DIESELS—FRONT END ACCESSORY DRIVE MISALIGNMENT—FEAD BELT TRACKING ISSUES—VEHICLES BUILT AFTER 2/15/92

OTHER APPLICABLE ARTICLES: NONE
SUPERSEDES: 94-14-13
WARRANTY STATUS: Eligible Under The Provisions Of Bumper.To Bumper Warranty Coverage

OPERATION	DESCRIPTION	TIME
950522A	Perform Diagnostics, Replace Power Steering Bracket, Drive Belt, Crowned Routing Idler And Add Fan Pulley Spacer If Missing - F-Series	1.8 Hrs.
950522B	Perform Diagnostics, Replace Drive Belt, Crowned Routing Idler And Add Fan Pulley Spacer If Missing - F-Series	1.4 Hrs.
950522C	Perform Diagnostics, Replace Power Steering Bracket, Drive Belt, Crowned Routing Idler And Add Fan Pulley Spacer If Missing - E-Series	2.3 Hrs.
950522D	Perform Diagnostics, Replace Drive Belt, Crowned Routing Idler And Add Fan Pulley Spacer If Missing - Econoline	1.9 Hrs.
950522E	Additional Time To Replace Generator Bracket Or Add Shims As Required - F-Series	0.3 Hr.
950522F	Additional Time To Replace Generator Bracket Or Add Shims As Required - E-Series	0.4 Hr.
950522G	Additional Time To Correct Belt Tracking - F-Series	0.3 Hr.
950522H	Additional Time To Correct Belt Tracking - E-Series	0.4 Hr.
950522I	Additional Time To Replace Air Conditioning Compressor - E/F-Series	1.1 Hrs.
950522J	Additional Time To Correct Vacuum Pump Pulley Press On Shaft - E/F-Series	0.1 Hr.

DEALER CODING

BASIC PART NO.	CONDITION CODE
8678	36

OASIS CODES: 206000, 301000, 303000, 497000

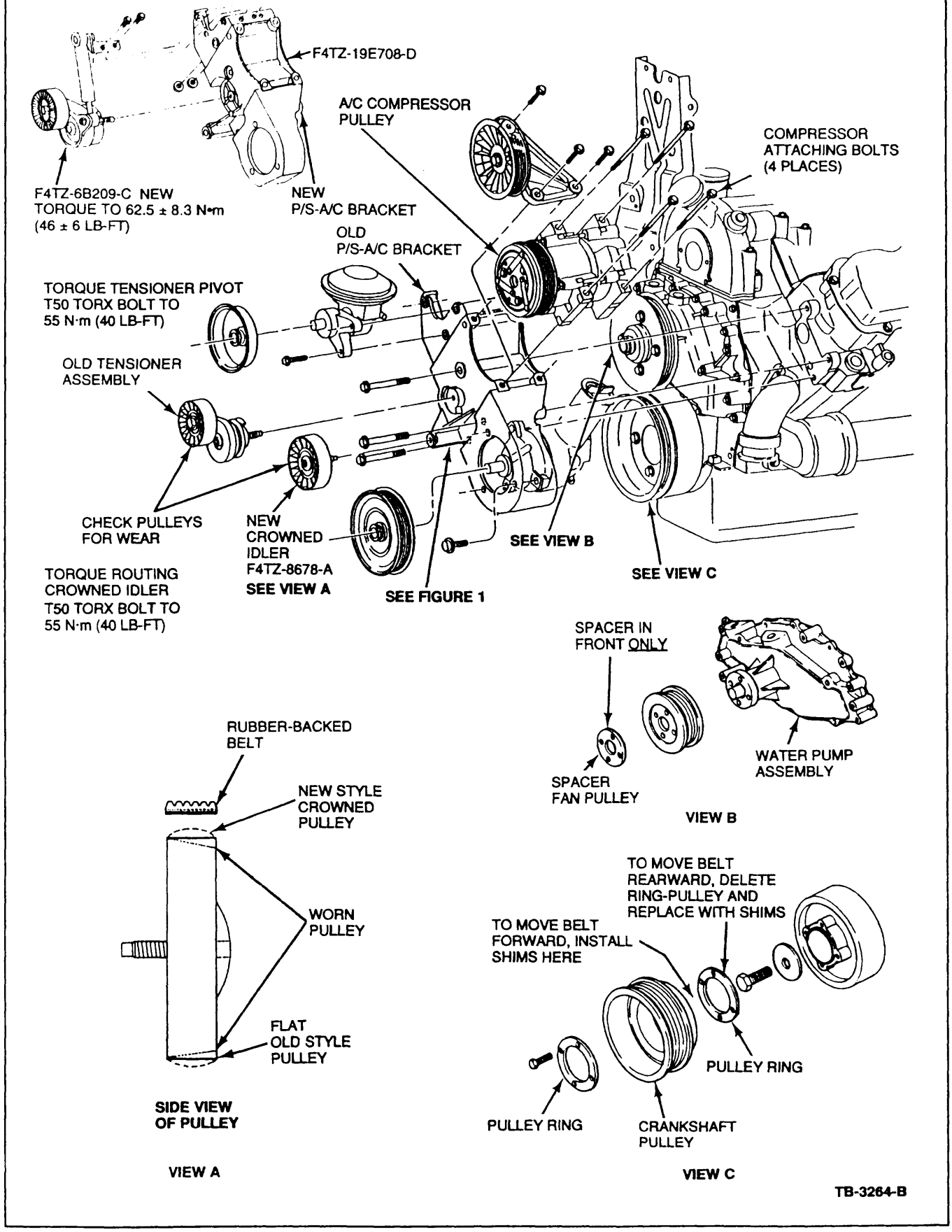

Figure 1 - Article 95-5-22

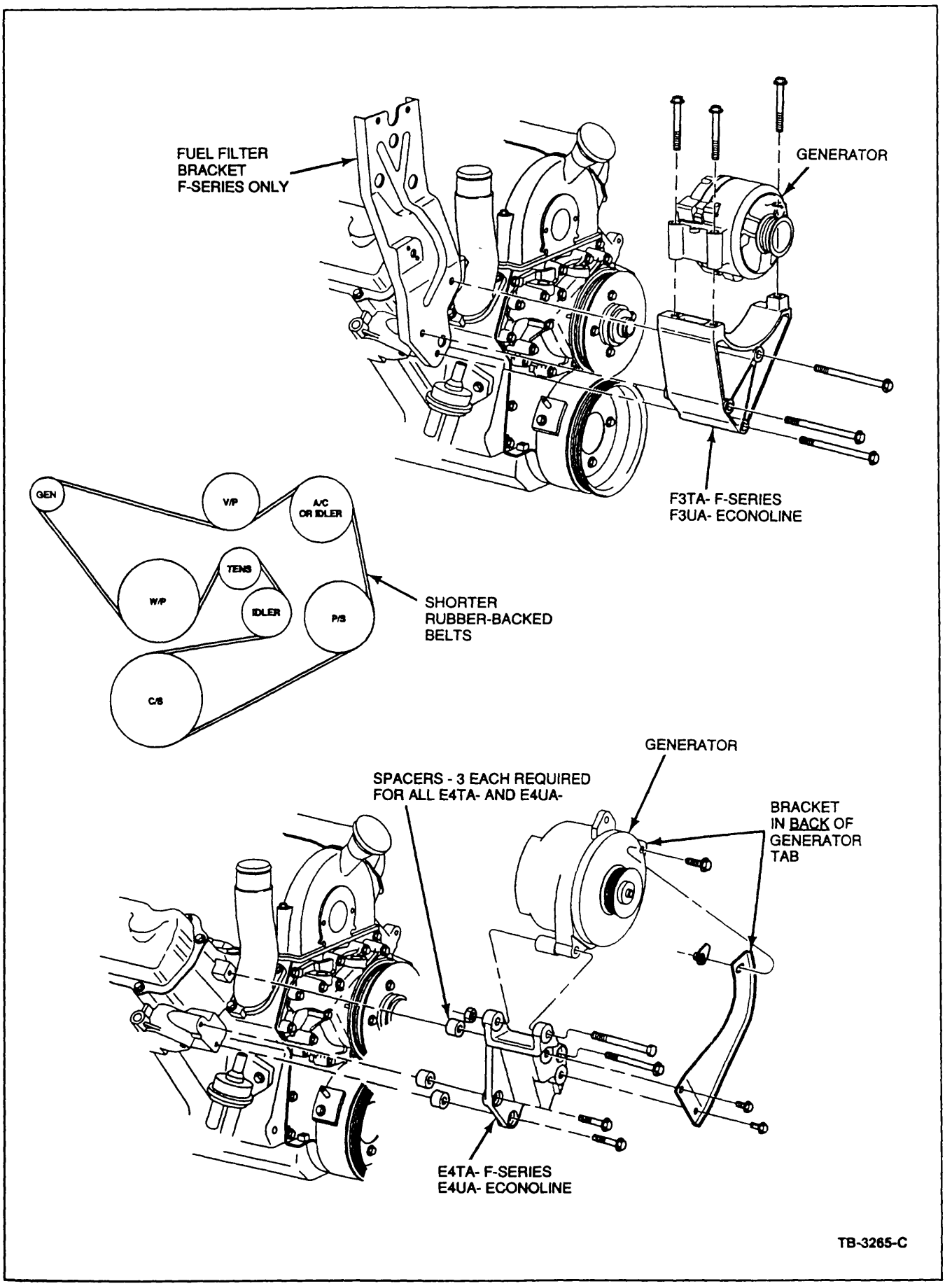

Figure 2 - Article 95-5-22

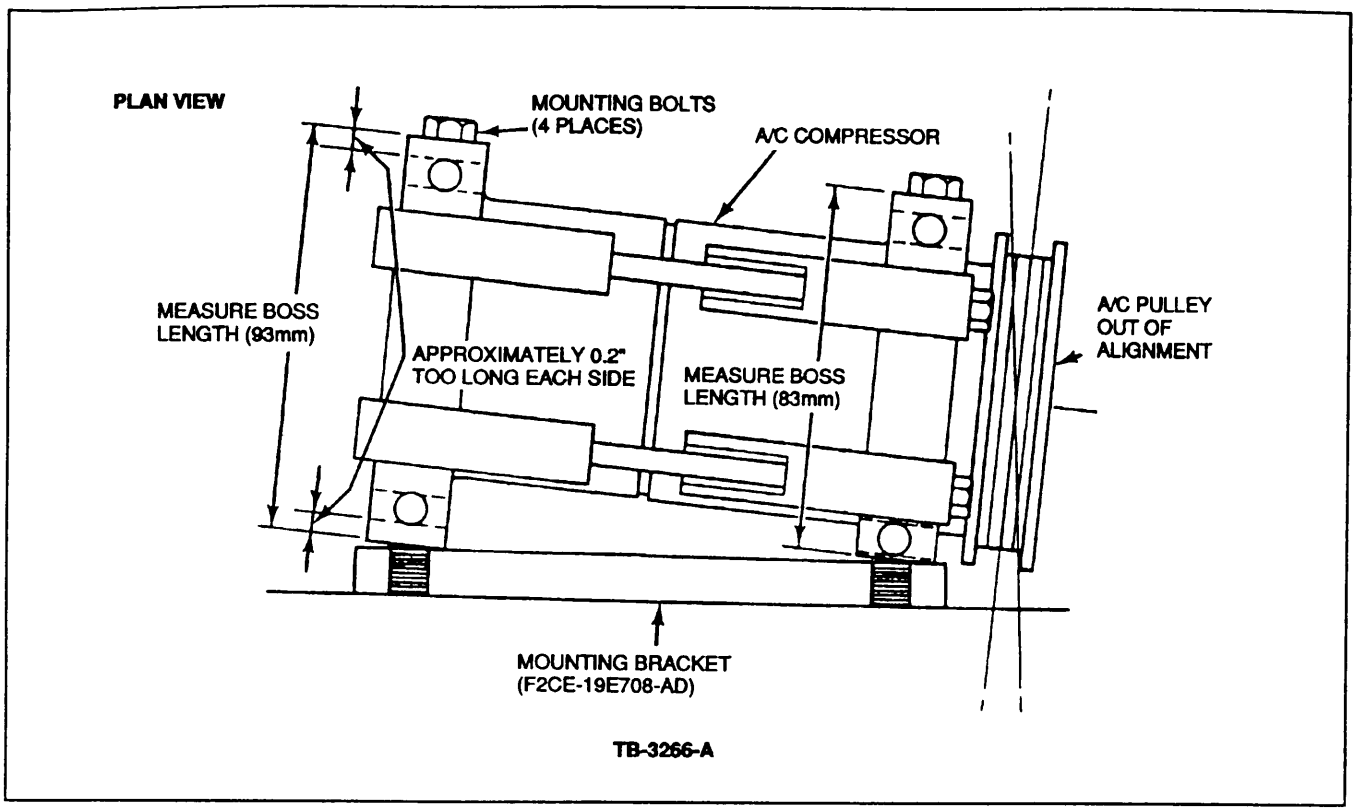

Figure 3 - Article 95-5-22